

REMARKS/ARGUMENTS**I. General**

Claims 1-37 are pending in the current application. The issues raised in the Office Action mailed April 1, 2003 are:

- Claims 1-4 and 8-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of US Patent Number 4,696,055 to Marshall (hereinafter *Marshall*) and further in view of US Patent Number 6,400,416 to Tomasz (hereinafter *Tomasz*); and
- Claims 5-7 are objected to as being dependent upon a rejected base claim, but would be allowed if rewritten in independent form including all of the limitations of the base claim and any intervening claims; and
- Claims 34-37 are allowed.

Claims 2, 15, and 24 have been amended. Claim 2 was amended to clarify that the second single sideband mixer translates the video bandwidth signal from a different frequency to a desired frequency which is shown in the specification at (Page 14, lns 12-15). Claim 15 was amended in order to correct a formality. The claim previously ended with a comma, and as amended, the claim correctly ends with a period. Claim 24 was amended to properly depend from claim 16 so that proper antecedent basis is present in claim 25. Proper antecedent basis in claim 25 is now present for, "said common integrated circuit substrate," which is introduced in claim 16 which is shown in the specification at (Page 5, lns 8-15). No new matter has been added by the claim amendments.

II. 35 U.S.C. § 103(a) Rejections over Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz*

Claims 1-4 and 8-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz*. Applicants respectfully traverse the rejection of record and assert that the rejected claims are allowable at least for the reasons stated below.

To establish a prima facie case of obviousness under 35 U.S.C. § 103(a), three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art cited must teach or suggest all the claim limitations. See MPEP §2143. Without conceding any other criteria, Applicants respectfully assert that the rejection does not satisfy the first and third criteria, and therefore, the claims are patentable under 35 U.S.C. § 103(a).

A. No Suggestion or Motivation to Combine

i. No Suggestion to Combine Applicants' Admitted Prior Art and *Marshall*

The Examiner concedes that the primary reference, the Applicants' admitted prior art, does not specifically disclose the existence of single sideband mixers. (See Office Action, page 3). Therefore, the Examiner relies on the secondary reference, *Marshall*, to teach that single sideband mixers are well known in the art. However, proper motivation is required in order to combine or modify references for an obviousness rejection under 35 U.S.C. §103.

It is well settled that the prior art must suggest the desirability of the claimed invention. MPEP §2143.01. Neither the Applicants' admitted prior art nor *Marshall* detail any such desirability to combine the teachings in order to provide single sideband mixer circuits as set forth by the claims. Additionally, the teaching or suggestion to make the claimed combination must be found in the prior art, and not based on the Applicant's disclosure. MPEP §2143, citing *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991). The Examiner has shown no such suggestion, and the motivation supplied in the Office Action to provide a lower inherent noise output and to eliminate image reject filters to save space and cost is derived from the Applicants' disclosure. (Specification, page 4, lns 2-4). Thus, claims 1-4 and 8-33 which recite the aspects relied upon in the secondary reference are patentable over the 35 U.S.C. §103(a) rejection of record.

ii. No Suggestion or Motivation to Combine Applicants' Admitted Prior Art, *Marshall*, and *Tomasz*

The Examiner concedes that the modified system of the Applicants' admitted prior art (Applicants' admitted prior art in view of *Marshall*) does not teach mixers disposed on a common integrated circuit substrate. (See Office Action, page 3). Therefore, the Examiner relies upon the third reference, *Tomasz*, to teach that mixers disposed on a common integrated circuit substrate are well known in the art. However, proper motivation is required to combine the reference teachings under 35 U.S.C. §103.

Neither the Applicants' admitted prior art, *Marshall*, nor *Tomasz* detail any desirability to combine all of the reference teachings. The Examiner merely asserts that mixers disposed on a common integrated circuit substrate are well known in the art, as disclosed by *Tomasz*, and thus it would have been obvious to have mixers disposed on a common integrated circuit substrate to save space and cost. As such, the Examiner is again using the Applicants' disclosure for motivation to combine. (Specification, page 4, lns 2-4). Therefore, claims 4, 8-10, 16, 20-25, and 30-33 which recite the aspects relied upon in the third reference are patentable over the 35 U.S.C. §103(a) rejection of record.

Additionally, a prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention. MPEP §2141.02. In the present case, the Applicants' admitted prior art expressly sets forth that conventional wisdom is to implement discrete components for the tuner configurations described. (Specification, page 2, lns 24-28). Accordingly, it is respectfully asserted that the Applicants' admitted prior art relied upon in rejecting the present claims teaches away from integrated circuits as taught by *Tomasz* and the claimed invention. Applicants' admitted prior art teaching away from *Tomasz* and the claimed invention provides evidence of a lack of motivation to combine the applied references to meet the claims. As such, the Applicants respectfully submit that based on the lack of motivation to combine, claims 1-4 and 8-33 are patentable over the rejection of record.

B. Applied References Fail to Teach All Claim Limitations

Applicants respectfully submit that even if one were to make the unsuggested modifications to the Applicants' admitted prior art in view of *Marshall* and further in view of

Tomasz as proffered by the Examiner, the system of the following claims would not result due to a failure to teach each and every element.

i. Independent Claims

Claims 15 and 30

Claim 15 recites:

...a first single sideband mixer circuit...

...a second single sideband mixer circuit...

Claim 30 recites:

...providing a first single sideband mixer...

...providing a second single sideband mixer...

Applicants respectfully assert the Applicants' admitted prior art in view of *Marshall* does not teach all claim limitations of independent claims 15 and 30 as claimed above. Applicants' admitted prior art teaches the existence of a mixer 121 to convert an input signal frequency to a high intermediate frequency utilizing a local oscillator 131. (Specification, page 8, lns 14-15). Additionally, the Applicants' admitted prior art teaches mixer 122 which is used to convert the high intermediate frequency signal to a desired output frequency signal utilizing local oscillator 132. (Specification, page 9, lns 1-3). However, the mixers 121 and 122 are not taught as a first single sideband mixer and a second single sideband mixer. *Marshall* teaches the existence of a tunable filter 14 which includes a first signal path 32 that includes a first mixer 40 and a second mixer 44, and a second signal path 34 that includes a third mixer 46 and a fourth mixer 50. (*Marshall*, Col. 3, lns 21-36; Fig. 2). These mixers 40, 44, 46, and 50 make up one tunable filter 14 which may be assumed, arguendo, to be similar to one single sideband mixer. However, *Marshall* only teaches the existence of one tunable filter 14, and as such, does not teach the existence of two single sideband mixers, a first single sideband mixer and a second single sideband mixer, as claimed above. Additionally, *Marshall* states that by taking an i.f. signal from output 24, the need for a second mixing operation to is avoided. (*Marshall*, Col. 3, lns 10-12). Furthermore, the Examiner does not rely on *Tomasz* to cure this deficiency. *Tomasz* teaches the existence of a first mixer 208 and second mixers 214, (*Tomasz*, Col. 3, lns 27-55; Fig. 2), but these mixers are not taught as a first and a second single sideband mixer. Therefore, no combination of Applicants' admitted prior art, *Marshall*, or *Tomasz* teaches all the elements of independent claims 15 and 30.

Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for

claims 15 and 30 be withdrawn.

ii. Dependent Claims

Claims 2-4, 8-14, 16-29, and 31-33 depend directly or indirectly from their respective base claims 1, 15, and 30, and thereby, they inherit all of the respective limitations. Accordingly, it is respectfully submitted that the dependent claims are allowable based on their dependency from independent base claims 1, 15, and 30 for at least the reasons discussed above. Thus, Applicants respectfully submit that based on the arguments above, claims 2-4, 8-14, 16-29, and 31-33 are patentable over the 35 U.S.C. §103(a) rejection of record.

In addition to their dependency from the respective base claims 1, 15, and 30, dependent claims 2-4, 8-14, 16-29, and 31-33 are also allowable based on the further limitations presented below:

Claims 2-10

Claims 2-10 recite:

...a first single sideband mixer...wherein said first single sideband mixer is disposed between said input signal interface and said second single sideband mixer...

...a second single sideband mixer...

Applicants respectfully assert that in addition to claims 2-10 dependence from patentable independent claim 1, the Applicants' admitted prior art in view of *Marshall* does not teach the claim limitations of claims 2-10 as claimed above. Similar to the arguments presented above for independent claims 15 and 30, *Marshall* only teaches the existence of one tunable filter 14, and as such, *Marshall* does not teach the existence of two single sideband mixers. Furthermore, *Tomasz* does not cure this deficiency. As such, Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach both a first single sideband mixer and a second single sideband mixer as claimed above. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claims 2-4 and 8-10 be withdrawn.

Claims 11, 13, & 14

Claims 11, 13, and 14 recite:

...a filter ...providing attenuation of image signals substantially equal to a difference between system requirements and image rejection achieved by said first single sideband mixer.

Applicants respectfully assert that in addition to claims 11, 13, and 14's dependence from patentable independent claim 1, the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claims 11, 13, and 14 as listed above. The Examiner states that Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* discloses a filter coupled to a first single sideband mixer. However, *Tomasz* merely teaches a filter 210 that is coupled to a first mixer 208 for filtering an intermediate frequency signal, (*Tomasz*, Col. 3, lns 28-33; Fig. 2), but *Tomasz* does not teach providing the attenuation of image signals equal to a difference between system requirements and image rejection achieved by a first single sideband mixer as claimed in claims 11, 13, and 14. As such, the references cited fail to teach all the claim limitations of claims 11, 13, and 14. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claims 11, 13, and 14 be withdrawn.

Claim 12

Claim 12 recites:

...a filter ...providing attenuation of carrier leakage signals substantially equal to the difference between system requirements and carrier leakage rejection achieved by said first single sideband mixer.

Applicants respectfully assert that in addition to claim 12's dependence from patentable independent claim 1, the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claim 12 as listed above. The Examiner states that Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* discloses a filter coupled to said first single sideband mixer. However, *Tomasz* simply teaches a filter 210 that is coupled to a first mixer 208 for filtering an intermediate frequency signal, (*Tomasz*, Col. 3, lns 28-33; Fig. 2), but *Tomasz* does not teach providing the attenuation of carrier leakage signals equal to a difference between system requirements and carrier leakage rejection achieved by a first single sideband mixer as claimed in claim 12. As such, the references cited fail to teach all the claim limitations of

claim 12. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claim 12 be withdrawn.

Claims 17 & 18

Claims 17 and 18 recite:

...a phase shifter at said first input to split a signal provided thereto...

Applicants respectfully assert that in addition to claims 17 and 18's dependence from patentable independent claim 15, the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claims 17 and 18 as listed above. The Examiner states that Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* discloses a first single sideband mixer comprising a phase shifter to provide in-phase and quadrature signals citing to element 54 of figure 2 of *Marshall*. However, *Marshall* teaches that a phase shifter 54 is connected to the output of local oscillator 52, and the output of phase shifter 54 is connected directly to the second inputs of the first and second mixers 40 and 44. (*Marshall*, Col. 3, lns 42-48). This does not teach that the phase shifter is located at a first input to split the signal provided thereto as claimed above. *Tomasz* does not cure this deficiency. As such, the references cited fail to teach all the claim limitations of claims 17 and 18. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claims 17 and 18 be withdrawn.

Claims 21 & 22

Claims 21 and 22 recite:

...an amplifier coupled in a signal path between said first single sideband mixer circuit and said second single sideband mixer circuit

Applicants respectfully assert that in addition to claims 21 and 22's dependence from patentable independent claim 15, the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claims 21 and 22 as listed above. The Examiner states that Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* disclose an amplifier coupled between a first and second mixer. The Examiner cites to element 111 of the Applicants' admitted prior art and element 224 of figure 3 of *Tomasz* in making the rejection. However, neither amplifier cited by the Examiner teaches an amplifier coupled in a signal path between a first and second single sideband mixer. The elements cited teach amplifiers at the beginning of a mixer and not

coupled in a signal path between a first and second single sideband mixer. As such, the references cited fail to teach all the claim limitations of claims 21 and 22. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claims 21 and 22 be withdrawn.

Claims 24 & 25

Claims 24 and 25 recite:

...a filter coupled in a signal path between said first single sideband mixer circuit and said second single sideband mixer circuit, wherein said filter provides attenuation approximately equal to a difference between system requirements and an amount of image rejection provided by said first single sideband mixer.

Applicants respectfully assert that the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claims 24 and 25 as listed above. The Examiner states that Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* discloses a filter coupled to a first single sideband mixer. However, *Marshall* teaches the existence of a polyphase filter 58 that is disposed between mixers 40 and 46 and mixers 44 and 50, but this filter is part of the N-path filter 14. (*Marshall*, Col. 5, lns 5-10; Fig. 8). This filter is not coupled in a signal path between a first single sideband mixer and a second single sideband mixer circuit. Furthermore, *Tomasz* teaches a filter 210 that is coupled to a first mixer 208 for filtering an intermediate frequency signal, (*Tomasz*, Col. 3, lns 28-33; Fig. 2), but this filter is not coupled in a signal path between a first single sideband mixer and a second single sideband mixer that provides attenuation equal to the difference between system requirements and an amount of image rejection provided by the first single sideband mixer. As such, the references cited fail to teach all the claim limitations of claims 24 and 25. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claims 24 and 25 be withdrawn.

Claims 26-29

Claims 26-29 recite:

...wherein said first single sideband mixer comprises a substantially fixed frequency carrier and said second single sideband mixer comprises a variable frequency carrier.

Applicants respectfully assert the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claims 26-29 as listed

above. *Tomasz* teaches that first and second reference signals 204 and 206 each include a local oscillator network 270 having multiple components such as a variable controlled oscillator 272. (*Tomasz*, Col. 6, lns 43-49). However, this oscillator network is not part of a first or a second single sideband mixer. Additionally, *Marshall* teaches the existence of a local oscillator 52 that is connected to the third and fourth mixers 46 and 50. (*Marshall*, Col. 3, lns 42-49). However, this oscillator is not a variable frequency carrier, and the oscillator is not part of a first or a second single sideband mixer. Therefore, no combination of the references cited teach a first single sideband mixer that comprises a fixed frequency carrier and a second single sideband mixer that comprises a variable frequency carrier as claimed in claims 26-29. As such, the references cited fail to teach all the claim limitations of claims 26-29. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claims 26-29 be withdrawn.

Claims 31-33

Claim 31 recites:

..disposing a filter between said first single sideband mixer and said second single sideband mixer, wherein said filter is adapted to substantially rely upon said first single sideband mixer for image rejection.

Applicants respectfully assert the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claim 31 as listed above. *Marshall* teaches the existence of low pass filter 42 between mixers 40 and 44 and low pass filter 48 which is between mixers 46 and 50. (*Marshall*, Col. 3, lns 22-36; Fig. 2). Additionally, *Marshall* teaches a polyphase filter 58 that is disposed between mixers 32, 46 and mixers 44 and 50. (*Marshall*, Col. 5, lns 5-10; Fig. 8). However, these filters are part of the N-path filter 14 which is similar to the single sideband mixer. As such, *Marshall* only teaches one N-path filter, and therefore does not teach disposing a filter between a first single sideband mixer and a second sideband mixer which is adapted to rely upon the first single sideband mixer for image rejection. Furthermore, *Tomasz* teaches a filter 210 that is coupled to a first mixer 208 for filtering an intermediate frequency signal, (*Tomasz*, Col. 3, lns 28-33; Fig. 2), but *Tomasz* does not teach a filter that is between a first single sideband mixer and a second single sideband mixer. As such, the references cited fail to teach all the claim

limitations of claim 31. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claim 31 be withdrawn.

Claims 32 and 33 recite:

...at least one filter having frequency selection characteristics insufficient to independently provide head end quality signal characteristics.

Applicants respectfully assert the Applicants' admitted prior art in view of *Marshall* and further in view of *Tomasz* fails to teach all the claim limitations of claims 32 and 33 as listed above. *Marshall* and *Tomasz* teach the use of filters, but neither *Marshall* nor *Tomasz* teaches the use of a filter having frequency selection characteristics insufficient to independently provide head end quality signal characteristics. As such, the references cited fail to teach all the claim limitations of claims 32 and 33. Hence, the Applicants respectfully request that the 35 U.S.C. §103(a) rejection of record for claims 32 and 33 be withdrawn.

Additionally, Applicants would like to point out that claims 31-33, although indicated as rejected in the Office Action, are not clearly and specifically addressed within the body of the Office Action. Accordingly, Applicants respectfully point out that the rejection of claims 31-33 do not comport with Office policy. Specifically, the Examiner is directed that, in accordance with the Patent Law, whenever, on examination, any claim for a patent is rejected, the Examiner must provide notification of the reasons for rejection together with such information and references as may be useful in judging the propriety of continuing the prosecution. 35 U.S.C. § 132. The Examiner is also required to clearly communicate findings, conclusions, and reasons which support all proposed rejections. MPEP 2106 (VII). As such, the Examiner has not specifically articulated any rejection early in the prosecution process so that the applicant has the opportunity to provide evidence of patentability and otherwise respond completely at the earliest opportunity, nor has the Examiner clearly communicated reasons to support the rejection of claims 31-33. Applicants therefore request that the Examiner specifically set forth the grounds for rejection with respect to claims 31-33 in order that Applicants may have a full and fair opportunity to explore the patentability of these claims.

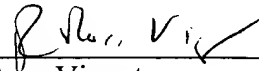
III. Summary

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

Applicants believe no fee is due with this response. However, if a fee is due, please charge Deposit Account No. 06-2380, under Order No. 47524/P087US/09704678 from which the undersigned is authorized to draw.

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Respectfully submitted,

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